CI/CD

GIVE YOUR APPLICATION AUTO-DEPLOY SUPERPOWERS

INTRODUCTION

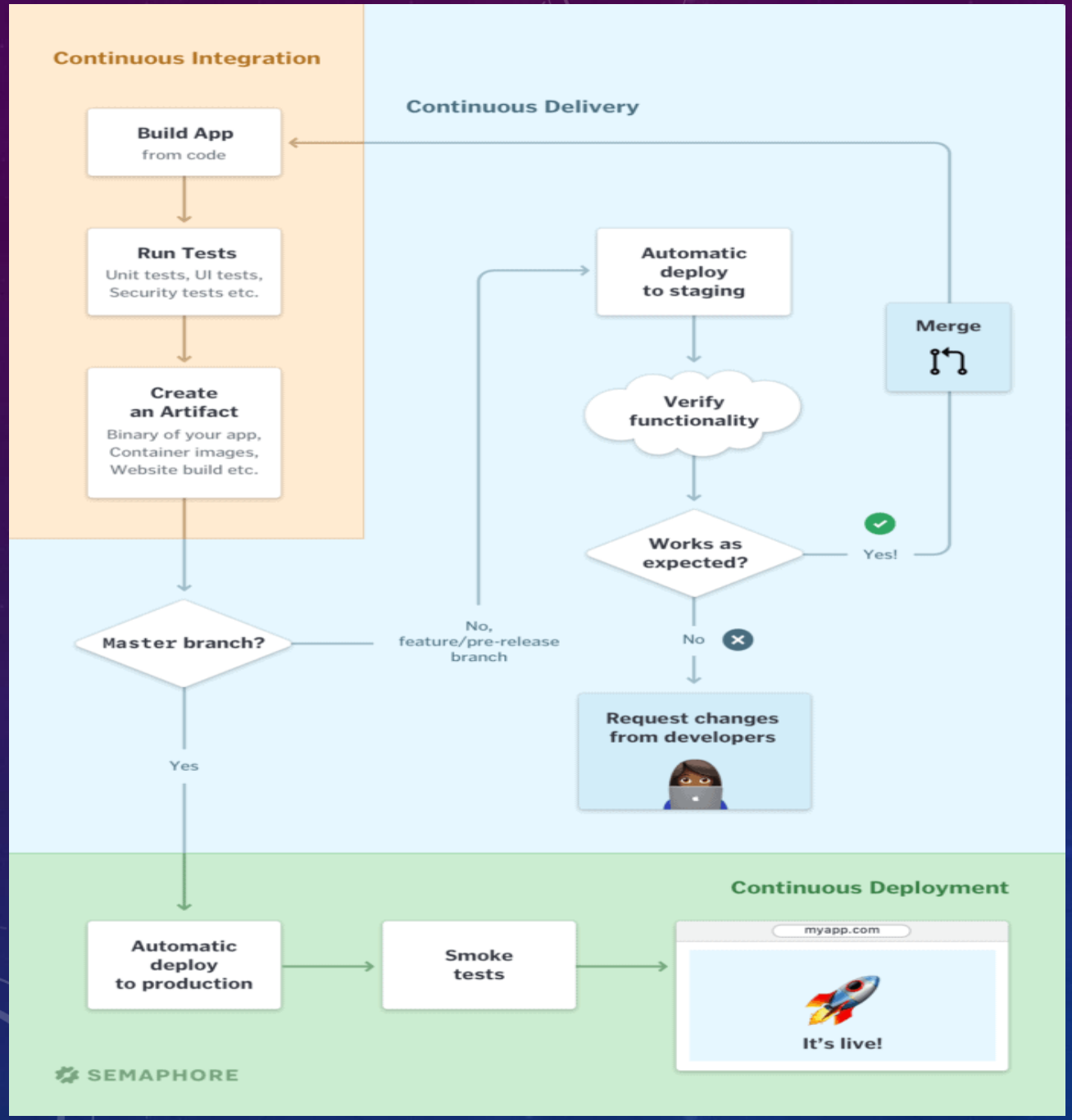
- CI/CD is a way of developing software in which you're able to release updates at any time in a sustainable way. When changing code is routine, development cycles are more frequent, meaningful and faster.
- "CI/CD" stands for the combined practices of Continuous Integration (CI) and Continuous Delivery (CD).
- Continuous Integration is a prerequisite for CI/CD, and requires:
- Developers to merge their changes to the main code branch many times per day.
- Each code merge to trigger an automated code build and test sequence. Developers ideally receive results in less than 10 minutes, so that they can stay focused on their work.

WHY ARE CI/CD SO IMPORTANT?

- Some of the benefits of CI/CD tools include:
- Beat overwhelm by building, testing, deploying, and monitoring your code from a single CI/CD tool.
- Automate repetitive tasks when building, testing, deploying, and maintaining software.
- Speed up time-to-market by minimizing manual labor and risk of human error.
- Free up software engineers to focus on more creative tasks, such as inventing new features, rather than doing repetitive work.
- Configure the right environment for software or code to run at its best.
- Identify and resolve issues before they affect customers.
- Support seamless collaboration between distributed software engineers, such as creating tasks, backlogs, and keeping track of CI/CD processes.
- Test code changes to ensure that only high-quality, secure code is pushed to live environments.
- Some CI/CD tools serve as version control, knowledge management, or cost management tools.

CI/CD PRINCIPLES

- Continuous Delivery practices take CI further by describing principles for successful production deployments:
- **Architect the system in a way that supports iterative releases**. Avoid tight coupling between components. Implement metrics that help detect issues in real-time.
- **Practice test-driven development to always keep the code in a deployable state**. Maintain a comprehensive and healthy automated test suite. Build in monitoring, logging, and fault-tolerance by design.
- **Work in small iterations**. For example, if you develop in feature branches, they should live no longer than a day. When you need more time to develop new features, use feature flags.
- Developers can **push the code into production-like staging environments**. This ensures that the new version of the software will work when it gets in the hands of users.
- **Anyone can deploy any version** of the software to any environment on demand, **at a push of a button**. If you need to consult a wiki on how to deploy, it's game over.
- **If you build it, you run it**. Autonomous engineering teams should be responsible for the quality and stability of the software they build. This breaks down the silos between traditional developers and operations groups, as they work together to achieve high-level goals.
- To make CI/CD a reality, you need to automate everything that you can in the software delivery process and run it in a CI/CD pipeline

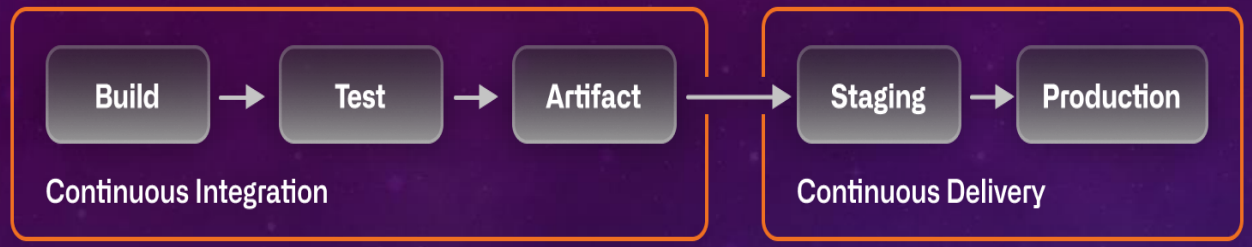


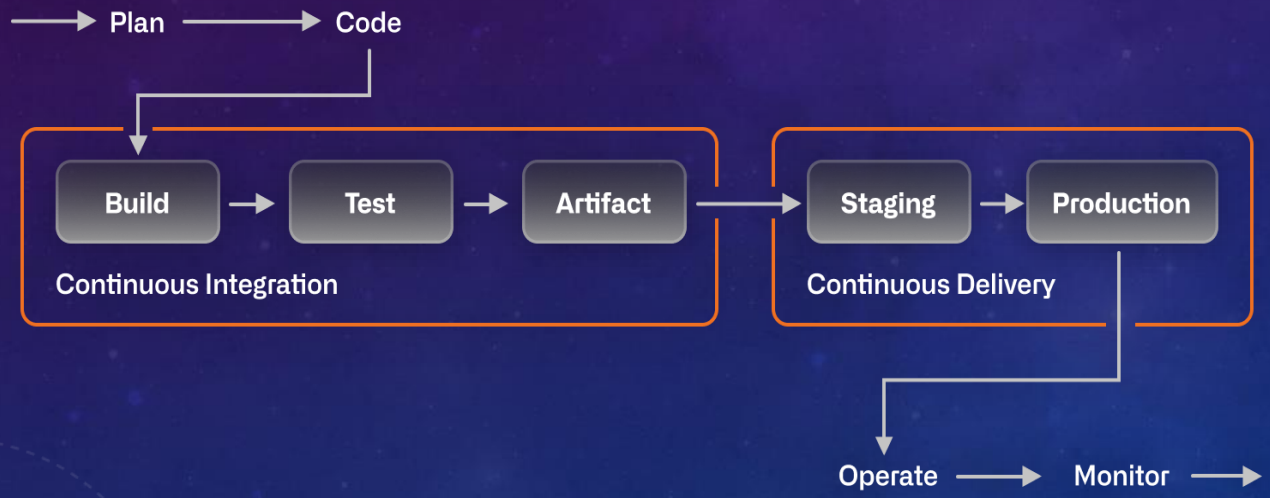
CI/CD pipeline

END-TO-END CI/CD TOOLS

	circleci	Jenkins	Bamboo	Buddy	TeamCity
Supported OS	Linux, macOS, Android, Windows	Linus (and other Unix-like OS), Windows, macOS	Linux, Windows, macOS, Solaris	Linux, Windows	Linux, Windows, macOS, Unix-based OS
Standout Features	Fast, secure, and highly customizable Supported migration from other CI/CD tools	Use as a simple CI server or extend into a CI/CD hub with many plugins Large community	Rich integrations, and end-to-end	User-friendly, fast, and Android/IOS build support	Flexibility, user-friendly
Open-Source	No	Yes	No	No	No
Cloud Or On-Premises	Both	Both	Both	Both	Both
Supported Git Repos	GitHub, GitLab, BitBucket	Any Git repository	Native BitBucket, any Git repository	Any Git repository	GitHub, GitLab, BitBucket
Free Version	Yes	Yes	Free 30-day trial	Yes, up to 5 projects	Free up to 100 builds and running 3 parallel builds
Pricing	From $15/ month	Free and open-source	From $10/ year for up to 10 jobs	From $75/ month for up to 20 jobs (cloud) and $35/user/ month (on-premise)	From $299/ build agent

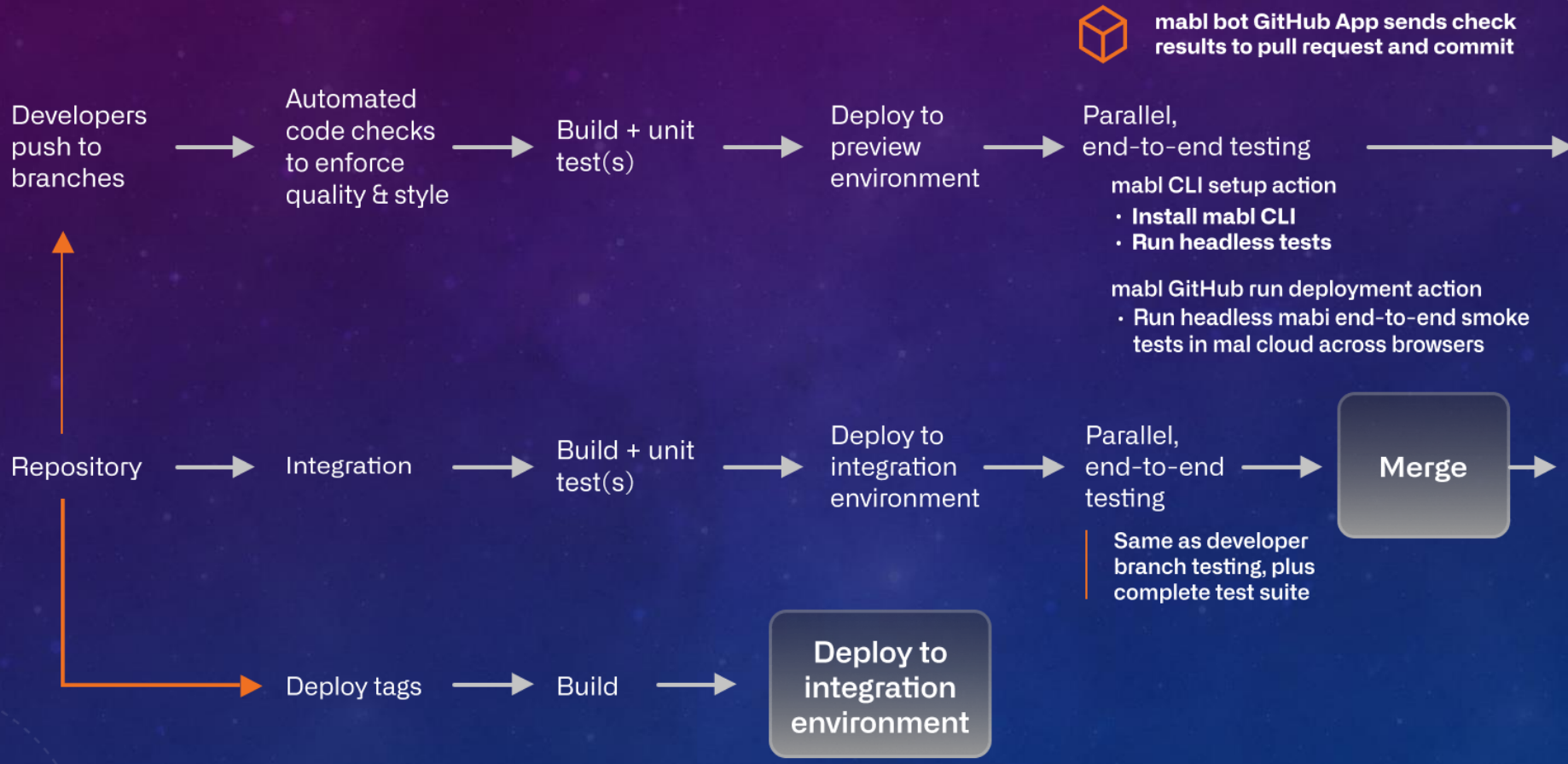
A CI/CD PIPELINE





Continuous delivery vs. continuous deployment

EXAMPLE CI/CD WORKFLOW



Thank You

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